



Research Article

The Stakes and Challenges of Waste Management in Bui Division, North West Region of Cameroon

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Abstract

Solid waste management remains a major environmental and governance challenge for municipalities, particularly in rapidly urbanizing African cities where institutional capacity, infrastructure, and community participation influence the effectiveness of waste service. Rapid urbanization and changing consumption patterns are increasing the quantity and complexity of municipal solid waste generated worldwide, creating growing pressures on collection, treatment, and disposal systems. The city council and local councils in the Bui Division are working relentlessly to improve the urban landscape environment despite their limited resources. This study examines the actual situation of solid waste in the Bui Division and elaborately focuses on solid waste management strategies and mechanisms put in place by authorities to ensure proper disposal and management. This study also examines the efforts deployed by the city council authorities and local actors to ensure an efficient solid waste management system. The methodology adopted in this study to carry out investigations includes both primary and secondary methods of data collection. One method employed in collecting data included field trips to dump sites, within the study area. The results obtained revealed that solid waste management practices such as dumping, landfilling, composting, and to some extent incineration were the most common solid waste management mechanisms practiced in the area. It further revealed that a solid cooperation between the public and private sector in the public-private partnership agreement is implemented through the integrated waste management system. Strengthening collaboration among municipal authorities, communities, private operators, NGOs, and other local actors could improve environmental awareness and public participation in waste management and the dangers of poor solid waste management in the study area.

Keywords

Solid Waste Management, Technics, Landscape, Transformation

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1. Introduction

The management of solid waste in most communities is important for the wellbeing of the population in any given community. This research therefore looks at the challenges faced by the local authorities in the management of solid wastes in the area. A deteriorating urban environment is the enemy of sustainable development. Protecting the environment is not an alternative to economic growth—it is a precondition of efficient economic development (United Nations (UN) 1992:25). Solid waste management is one of the major environmental problems facing municipalities today. [1].

Waste management is a vital domain to local authorities. It is vital in their exploitation and collection and, finally, transportation to treatment sites. Currently this approach has proved to be slow in realization due to the heavy financial requirements involved. There is an urgent need to provide for the safe disposal of the solid waste generated by urban residents and businesses. The increase in urban, economic, and industrial activities as well as the resultant population increase has led to an increase in the quantity of solid waste generated [2].

Waste management policies hardly follow the realities of the terrain. The changing nature of this phenomenon has brought about another crucial problem, which is that of protection and conservation of the environment. [3] It is therefore obvious that the study area is experiencing this tendency due to internal and external circumstances, which may cause eminent environmental problems.

2. Methodology

A wide range of methodology was adopted by this study. This study in its nature was evaluative, analytic, and prospective, with qualitative and quantitative analysis of the data collected. Evaluation was done on solid waste management in the municipality and strategies adopted by the council authorities in solid waste management. A suitable combination of varying methods at the different levels of research gave authentic results. Formal interviews were conducted with resource persons dealing with waste at different levels. Regular quarter meetings, social gatherings, and associations involved in waste disposal and management constituted the bedrock of groups that received attention. [4] Research documents were consulted, such as published and unpublished textbooks, dissertations, administrative documents, and journals that have a

direct and indirect relationship with waste disposal and management. Maps within the study area were studied and taken into consideration. This helped in identifying sites where waste production dominated.

3. Results

The results obtained revealed that most households were sources of different waste types in the area. It was also realized that institutions and enterprises equally played their role in disposing of waste in the area. This therefore contributed to the tons of waste deposited, causing dereliction to the environment.

4. Discussion

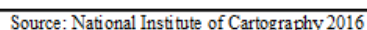
4.1. Location of the Study Area

Bui Division is one of the seven divisions of the Northwest Region of Cameroon. The division has a total surface area of 2,297 km² with a population of 321,969 inhabitants in 2005 (2005 National Census). [5] Bui Division lies between latitude 6°35' North and longitude 10°30' and 11°00' E. It is roughly a rectangular-shaped division occupying 13.3% of the land surface area of the Northwest Region. The division derived its name from the River Bui, the only significant river of its size in the area. Bui Division is an example of a traditional entity that still abides a lot by its customs and traditions. The division lies to the northeast, forming part of the ecological zone of the western highlands. Bui Division shares boundaries to the north with Donga Mantung.

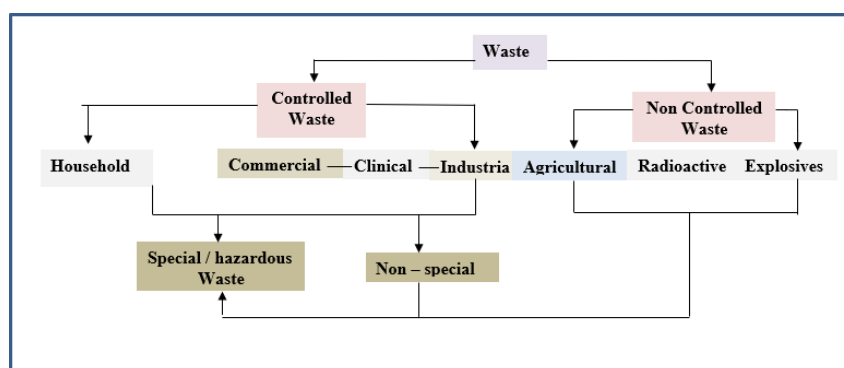
Division, to the East with Noun Division, to the South with Ngoketunja Division and the West with Boyo Division, as seen in Figure 1.

4.2. Waste Classification Background Strategies

Waste classification shows clearly how waste can be classified into controlled and non-controlled waste bringing out the different types of wastes and their classification frameworks.



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Source: Fieldwork 2023

Figure 2. Waste classification strategies and background technics.

4.3. Waste Classification Framework and Economic Sense

Waste has existed since the beginning of humanity. Before recorded history, this waste decomposed in small quantities according to a natural cycle. With the development of cities, industrialization, population booms, and the consumption of large amounts of waste, the issue of how to collect and store it appeared [6]. As raw material resources become rare and we tackle climate change, the notions of recycling and recovery have emerged. For each type of waste, customized ways to treat it now exist (Agence de l'Environnement et de la Maîtrise de l'Énergie ADEME 1994).

4.4. Typology of Solid Wastes Dominant in the Area

Solid wastes production originates from different sources. The sources identified in this context include domestic (household) solid wastes; commercial solid wastes (wastes from market areas, hotels and restaurants, carpentry workshops, saloons and sewing centers, photo studios and garages); solid wastes from large establishments such as hospitals, administrative areas and schools; and lastly, solid waste from agro-industrial factories such as rice hauling centers, corn mills and bakery centers. [7] Although the wastes vary in relation to the producers, some producers produce similar wastes. This waste generated consists of about 60% of the total solid wastes in the municipality.

4.5. Wastes from the Bakery Centers

Wastes that result from the daily baking of bread and other baking products include the organic matter such as the remains of flour, unsold bread, papers, and cartoons. Inorganic waste includes plastics, plastic containers, and metal containers. Some of the bakeries in town are mostly located in the different villages of the area. [8] The above waste sources indicate that there are a variety of solid waste producers, whose

sources are basically grouped into domestic or household wastes, commercial wastes, wastes from large establishments, and agro-industrial wastes.

4.6. Public Depositional Sites

4.6.1. Market Junctions (Squares)

Uncontrolled waste disposal sites are particularly problematic in Cameroonian urban environments, where inadequate collection infrastructure and limited source separation can contribute to the proliferation of informal dumpsites [9]. Most of the waste here is household waste made up of peelings of foodstuffs, which, most of the time, are usually biodegradable. Prominent markets with solid waste deposit points are found in the food markets within the area.

4.6.2. Hospital Depositional Sites

This is a complex waste deposition site because of the hazardous and toxic nature of these wastes. Specific waste management facilities are found in the hospitals, such as incinerators that handle the toxic and hazardous wastes in the hospitals. The wastes in the hospitals are separated into biodegradable and non-biodegradable. Such hospitals with this type of waste are public and private hospitals, not leaving out clinics and other small health facilities.

The disposition of solid wastes ties down with the hypothesis that the actual situation of solid wastes in the study area is deplorable. This, therefore, ties with the findings on the nature of waste production in the study area and the way in which this solid waste is disposed of properly.

4.6.3. Collection Proper

This can be defined as the operations effectuated by the public or private services, which consist of collecting or eliminating all solid wastes found in the various recipients, along the roadside, gutters, and empty lots, to their rightful dumping sites or areas of treatment, if at all there exist any.

The collection is usually done with the help of specialized vehicles destined for that [10]. These public dustbins are often

of varied volumes, and the provision of these dustbins varies in relation to the type of quarter in the study area. In planned quarters, waste disposal containers with moderate volumes are provided in each household or residence for collection. However, in spontaneous quarters where accessibility is not quite good, large public dustbins are provided at the roadside for the people to dump their waste. In most big towns of the country, these public dustbins are found and help most city council

authorities to collect their wastes easily. Some of the procedures used for solid waste collection include.

4.6.4. Ordinary Waste Collection in the Area

Vehicles which are trucks at times with or without compression. However, the compactor has its own disadvantages in that wastes of different types are mixed and crushed. Recyclables are lost or contaminated with unusable wastes.



Source: Fieldwork 2024

Figure 3. Public waste collection sites.

4.7. Use of Trash Cans to Collect Solid Waste

This includes the use of some rubber containers with lids, usually in the hospitals and some school environments, to dispose of the solid waste.

4.8. Methods and Mechanisms of Solid Wastes Management

4.8.1. Land Filling

This involves the disposing of waste in a landfill, involves burying the waste, and therefore remains a common practice in most countries. Landfills were often established in abandoned or unused quarries, mining voids, or borrow pits. A properly designed and well-managed landfill can be a hygienic and relatively inexpensive method of disposing of waste minerals. Landfills can cause odor problems, kill surface vegetation, and give off greenhouse gases. [11] This is one of the most prominent solid waste disposal methods that is carried out in most countries in the world, though its negative environmental impacts cannot be overemphasized.

4.8.2. Incineration

This is a disposal method in which solid organic wastes are subjected to combustion so as to convert them into residue and gaseous products. [12] This method is useful for the disposal of residue from both solid waste management and solid residue from wastewater management. Incineration is carried out

both on a small scale by individuals and on a large scale by industries.

4.9. Solid Waste Evacuation and Treatment

This involves the costs that are incurred in the process of solid waste evacuation at the city council. The expenditure lines here are concerned with the provision of fuel for the trucks transporting the wastes and the maintenance of this equipment for their effective waste management in the municipality. [13]

5. The Mechanisms of Solid Wastes Management

This involves the use of instruments, apparatus, means, and the methods used in solid wastes management in the country as a whole and in the administrative area. [14] These mechanisms will, therefore, be outlined in the following parts to show what the city council is doing concerning solid waste management.

5.1. Inadequate and Inappropriate Solid Waste Evacuation Equipment

Limited technical, financial, and institutional capacity remains a significant constraint on effective municipal solid waste management in Cameroon. The number of spe-

cialized trucks with compressors is just four, and this cannot ensure good coverage of the study area concerning solid waste evacuation. Most of the specialized trucks are already old and cannot be efficient again. Also serving the town of Bui with just four compressors, it cannot actually have good coverage, as most of the neighborhoods in the town cannot be covered.

5.2. Inadequate Solid Wastes Disposal Methods

The various methods and ways of managing solid wastes by the municipality include mostly open-air dumping in the dumpsite with no treatment and sorting hardly done on these wastes. This, therefore, accounts for an amalgam of wastes at the dumpsite. [15]

From our observation, there is hardly any treatment that is done on the solid wastes collected. They are dumped at the dumpsite with no use made of the wastes. Apart from dumping, therefore, no solid waste disposal method is applied, thus making the sector virgin for most of the solid waste management methods to be tested and applied in the study area.

6. Challenges of Solid Wastes Management

These are a major concern for solid waste management in the municipality. This inadequacy is seen at all stages of waste management, from generation, storage, collection, transportation, and final disposal. It was realized that increased population means increased waste generation. Formerly, wastes were disposed of in the backyard or in nearby farms. Most of the villages in the study area are largely covered with residential and commercial structures. [16]

7. Conclusion

The management of solid waste within the study area greatly contributes to the change in the panoramic view of the study area. The number of waste-related illnesses as outlined in the socio-environmental impacts of poor solid waste management clearly shows that a strict follow-up of solid waste management was not put in place to ensure effective and efficient management. In a nutshell, the view of the area can be redressed by putting in place an effective solid waste management system.

Abbreviations

UN	United Nations
ADEME	Agence de l'Environnement et de la Maitrise de Energy
ENSPY	Ecole Nationale Supérieure Polytechnique
US	United States

Author Contributions

Nyanchi Anderson Kongfeyin Tobouah: Conceptualization, Methodology, Writing – original draft

Ngenwie Precious Tamsang: Supervision, Writing – review & editing

Conflict of Interest

The authors declare no conflict of interest.

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